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THE BRYOLOGIST

VOL. XIII

JULY 1910

No. 4

NOTES ON *LOPHOZIA ALPESTRIS* (SCHLEICH.) EVANS

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IN THE BRYOLOGIST for March, 1910, the writer discusses "Some Lophozias of the Ventricosa-group" and one of these species, *Lophozia confertifolia* Schiffner approaches *Lophozia alpestris* (Schleich.) Evans, the subject of the present notes. The former, however, is of a more delicate texture, has larger leaf-cells with more delicate walls, and the American specimens so far collected have been sterile. Also it is a bluer-green in color; and the shallow sinus with unequal, frequently obtuse leaf-tips is very similar in the two species, except that it is more uniform in *Lophozia confertifolia*.

Lophozia alpestris, especially in some of its larger forms, might be confused with *Lophozia ventricosa* (Dicks.) Dum. but it has two individual characters. According to Dr. Evans, the smaller leaf-cells, 18μ instead of 23μ , and Gottsche points out the diversity of the sinus of the leaves on the same stem. It is a species of subalpine and alpine regions, taking the place of *Lophozia ventricosa* in the higher altitudes. Bernet says "it is common on bare siliceous ground on all the range of Mt. Blanc, replacing the *Lophozia Muellieri* (Nees) Dum. of the calcareous Jura and Bernese Oberland. It is polymorphous, as the great number of synonyms attests."

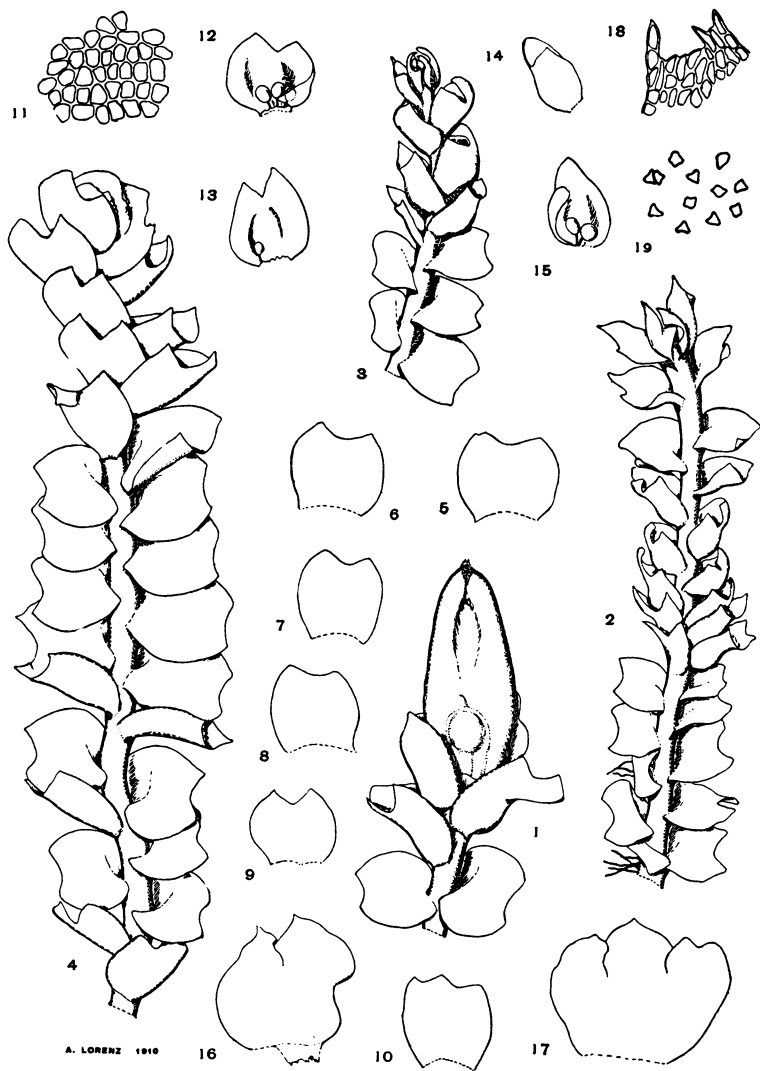
In New England it has been reported from Maine, New Hampshire, and Vermont, being fairly common in the White Mountains, although not ubiquitous, like *Lophozia attenuata* (Mart.) Dum. Macoun¹ gives various Greenland and Canadian stations. Dr. Evans, in Collins' report of the Katahdin mosses, Rhodora III, p. 181, 1901, first puts it into *Lophozia*.

Kaalaas² says "well distributed over all the mountainous parts of Norway—always on a siliceous substratum—varies most markedly in habit, color, size and leaf-form, especially specimens from lower-lying stations seem to approach *Lophozia ventricosa*. Fertile specimens are on the whole collected seldom; yet seem in certain mountain sections to be somewhat common, but the majority of tufts are of male plants only."

The conditions are similar at Waterville, N. H. It grows on damp ground, either in pure stands or mixed with other mosses, while typical

1 Macoun, Cat. Can. Plants VII. p. 17 (1902).

2. Kaalaas. De Distr. Hep. in Norv. p. 335. 1893.



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PLATE VIII. *Lophozia alpestris*

Lophozia ventricosa grows on rocks in damp places, often on a perpendicular surface, should be dark-green, and the sterile tufts are flattened; while *Lophozia alpestris* ranges from green in the shade to being usually considerably pigmented with brown, where at all exposed to the sun. Theoretically, it does not like to live in the woods, but prefers open country.

Specimens from the south side of the "V" at Waterville, 2500 ft. alt., with only afternoon sun, grew on damp granite slopes, mixed with *Jungermannia sphaerocarpa* Hook. and *Marsupella emarginata* (Ehrh.) Dum. and bore abundant ♂ spikes.

Large brown plants from West Branch, near Osceola Camp, 1800 ft. alt., bore perianths with almost mature capsules, they were twice the size of the plants from the "V," and probably approach var. *a. latior* of Nees.¹

The species is dioicous. Warnstorf² says "Antheridia united into short, almost cone-like terminal spikes," but they are intercalary; there are five or six pairs of bracts, containing 1-3, usually two, large, watery-green antheridia.

Nees devotes many pages to this species, and describes sixteen varieties. According to Limpricht, however "his *Jungermannia sicca* is the ♂ plant of *Lophozia alpestris*, and could only at such a time be considered as a separate species, when the greatest weight was laid upon the presence of underleaves."

Nees says "very rarely, and only in its larger forms, does it develop fruit. One finds perianths and capsules in late autumn and early in spring, after the snow has melted. The outline of the leaves is roundish-ovate ranging toward quadrate and very unequal. The dorsal or hinder edge is straighter, only rarely curving forward somewhat toward the base, the ventral or forward edge forms on the contrary always a stronger curve, which however soon flattens out more or less, only rarely are all the leaves flat, usually their outer sides are strongly arched, the inner hollow, and then they are tilted obliquely forward and up, while the flatter leaves are spread out more sidewise. The tips, bending toward each other, quickly upon the beginning of drying bend inward more and more tensely, whereby this species makes itself particularly easily recognizable.

The leaves are quite stiff, thickish, smooth and shining, with a fatty shine, their color ranges from a fresh youthful green quite soon into a pale, yet more commonly into a reddish-yellow, from this into a dull red-brown and blackish-brown, and these colors, in most plants of this species, flow

1. Nees. *Naturges. der Em. Leberm.* II p. 109. 1838.

2. Warnstorf. *Kryptogamenfl. der Mark Brandenb.* p. 182. 1903.

into one another through many gradations. Also an agreeable blood-red shade occurs.

The fruit appears on the ends of the stems, where it often remains undeveloped. It comes, however, in respect to its structure and development, nearest to *Jungermannia ventricosa*. One chief difference lies, to be sure, in the structure of the perianth, which in *J. alpestris* is longish, almost cylindrical, without keels, obtuse, while in *J. ventricosa* it is short, swollen, plicate above, and with sharply toothed mouth.

Remarks on the differences of the two species.

Remark 2. The hollow form of the leaves on the fruit-bearing stem, while on the fertile *Jungermannia ventricosa* they stand out flat.

Remark 4. *Jungermannia ventricosa* is almost always grass-green.

Remark 6. The brown, not yellow gemmae of the ♂ plant, which otherwise resembles *Jungermannia ventricosa*."

Stephani¹ refers to it as follows: "Leaves extraordinarily different in form, as broad at the apex as at the base, yet also often narrower, tips acute and unequal, somewhat bent inward; the leaves on one and the same stem hardly resemble each other in form, and from this the plant is easily recognizable. One of the species that is oftenest confused."

However, its identification should offer but little difficulty after reference to the above-mentioned peculiarities, and it may even penetrate as far south as Mt. Greylock, Mass.

EXPLANATION OF PLATE VIII.

LOPHOZIA ALPESTRIS (SCHLEICH.) EVANS

1. Branch with perianth, antical view, $\times 87$.
2. Branch with ♂ inflorescence, antical view, $\times 87$.
3. Young ♂ inflorescence, $\times 87$.
4. Sterile branch, $\times 87$.
- 5, 6, 7, 8, 9, 10. Leaves, $\times 87$.
11. Cells from middle of leaf, $\times 430$.
- 12, 13, 14, 15. Perigonal bracts, $\times 87$.
- 16, 17. Perichaetical bracts, $\times 87$.
18. Teeth from mouth of perianth, $\times 430$.
19. Gemmae, $\times 430$.

All reduced to two-fifths.

The figures were all drawn by the writer, nos. 5, 6, 7, 8, 9, 10, 11, from specimens collected by Dr. Evans on Mt. Washington, N. H.; the remainder from specimens collected by the writer at Waterville, N. H.

Hartford, Conn.

1. Stephani. Deutsch. Jung. p. 34. 1879.